



**LD Biopharma, Inc.**  
7384 Trade Street, Suite B  
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Tel: 858-876-8266  
<http://www.ldbiopharma.com>

## - PRODUCT DATA SHEET -

**Name of Product:** Recombinant Human SP3 Protein  
**Catalog Number:** hTF-2258  
**Manufacturer:** LD Biopharma, Inc.

### Introduction

Human SP3 gene belongs to a family of SP1 related genes that encode transcription factors that regulate transcription by binding to consensus GC- and GT-box regulatory elements in target genes. SP3 protein contains a zinc finger DNA-binding domain and several transactivation domains, and has been reported to function as a bi-functional transcription factor that either stimulates or represses the transcription of numerous genes, which involved in different processes such as cell-cycle regulation, hormone-induction and house-keeping. Transcript variants encoding different isoforms have been described for this gene, and one has been reported to initiate translation from a non-AUG (AUA) start codon. Additional isoforms, resulting from the use of alternate downstream translation initiation sites, have also been noted. Recent data indicated that SP3 interacts with HDAC2 to regulate synaptic function and plasticity in neurons.

Full-length human SP3 cDNA (780aa , Isoform-I , derived from BC126414) was constructed with codon optimization using gene synthesis technology and expressed with a small T7-His-TEV cleavage site Tag (29aa) fusion at its N-terminal. It was expressed in E. coli as inclusion bodies. The final product was refolded using our unique “temperature shift inclusion body refolding” technology and chromatographically purified.

**Gene Symbol:** SP3 (SPR2)  
**Accession Number:** NP\_003102  
**Species:** Human  
**Size:** 10 µg / Vial  
**Composition:** 0.1 mg/ml, sterile-filtered, in 20 mM pH 8.0 Tris-HCl Buffer, with proprietary formulation of NaCl, KCl, EDTA, Sucrose and DTT.  
**Storage:** In Liquid. Keep at -80°C for long term storage. Product is stable at 4 °C for at least 30 days.

### Key References

Hidekuni Yamakawa, et al., *The Transcription Factor Sp3 Cooperates with HDAC2 to Regulate Synaptic Function and Plasticity in Neurons*. Cell Reports, 20, 1319-1334 (2017)



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Mihara N, et al., *Minimal essential region for kruppel-like factor 5 expression and the regulation by specificity protein 3-GC box binding* Gene 601, 36-43 (2017)

Cai Y, et al., *Trefoil factor family 2 expression inhibits gastric cancer cell growth and invasion in vitro via interactions with the transcription factor Sp3*. Int. J. Mol. Med. 38 (5), 1474-1480 (2016)

Duval E, et al., *Hypoxia inducible factor 1 alpha down-regulates type i collagen through Sp3 transcription factor in human chondrocytes*. IUBMB Life 68 (9), 756-763 (2016)

## Applications

1. May be used for in vitro SP3 mediated gene transcription regulation study in various cells, such as neuronal cells by intracellular delivery of SP3 protein with protein delivery reagent such as ProFectin reagent kit.
2. May be used for mapping protein-protein interaction.
3. May be used as specific substrate protein for kinase, and ubiquitin (Sumo pathway) related enzyme functional screening assays.
4. Potential therapeutic target protein for diseases treatment drug development, such as Alzheimer's disease by modulating SP3-HDAC2 pathway.
5. As immunogen for specific antibody production.

## Quality Control

Purity: > 70% by SDS-PAGE.

## Recombinant Protein Sequence

MASMTGGQQMGRGHHHHHENLYFQGGFEFGSTAPEKPKVQEEAALDVDSGGGGGGGGHGEYL  
QQQQQHNGAVAAAAAQTQPSPLALLAATCSKIGPPSPGDDEEEAAAAAGAPAAAGATGDLA  
SAQLGGAPNRWEVLSATPTTIKDEAGNLVQIPSAATSSGQYVLPQLQNLQNLQNIQIFSVAPGSDSSN  
GTVSSVQYQVIPQIQSADGQQVQIGFTGSSDNGGINQESSQIQIIPGSNQTLLASGTPSANIQN  
LIPQTGQVQVQVQVAIGSSFPGQTQVVANVPLGLPGNITFVPINSVDLDSLGLSGSSQTMTAGI  
NADGHLINTGQAMDSSDINSERTGERVSPDINETNTDLDLDFVPTSSSSQLPVTIDSTGILQQNTN  
SLTTSSGQVHSSDLQGNVIQSPVSEETQAQNIQVSTAQPVVQHLQLQESQQPTSQAQIVQGITP  
QTIHGVAQSGQNISSQALQNLQLQNLNPGTFLIQAQTVTPSGQVTWQTFQVQGVQNLQNLQIQNT  
AAQQITLTPVQTLTLGQVAAGGAFSTPVSLSSTGQLPNLQTVTVNSIDSAGIQLHPGENADSPA  
DIRIKEEFPDPEEWQLSGDSTLNTNDLTHLRVQVVDEEGDQQHQEGKRLRRVACTCPNCKEGGG  
RGTNLGKKKQHICHIPGCGKVYGKTSHLRAHLRWHSGERPFVCNWMYCGKRFTRSDDELQRHRR



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HTGEKKFVCPECSKRFMRS DHLAKHIKTHQNKKGIHSSSTVLASVEAARDDTLITAGGTTLILA  
NIQQGSVSGIGTVNTSATS NQDILTNT EIPLQLVTVSGNETME